

9-17-08-4982-12-sequence listing.txt
SEQUENCE LISTING

<110> CropDesign N.V.
<120> Stress Tolerance
<130> 4982-12
<140> 10/552,686
<141> 2005-11-21
<150> PCT/EP04/50513
<151> 2004-04-13
<150> EP 03076064.9
<151> 2003-04-11
<160> 11
<170> PatentIn version 3.2

<210> 1
<211> 1344
<212> DNA
<213> Beta vulgaris

<220>
<221> misc_feature
<222> (3)..(3)
<223> n is a, c, g, or t

<400> 1
cgnctgcagg aattcggcac gagttcgaa gtacccaaga ctccaagaga ggacgaactt 60
cagtttctct ctcctcgaaa tcctaattct ctctgctcaa atccctaatt ctctctccct 120
acgatcgtag agtctctgtt tttcaactgta taaatctatt caacaattt tctctctccct 180
attatttcaa tttcggtttg ctaattcaag gtgaatcaaa tgcggcaaa tatgtttcc 240
agacttttg gtgctaaatc tcgtgatgca gctactactg agactacttt atctacatta 300
gagaatttga atgagacact tgaatgcta gagaagaaag agcagcttct aatgaaaaag 360
gctactgcag aggttggaaa ggc当地agag ttccacaaggg caaagaataa acgtgctgct 420
ataacaatgtt taaagaggaa aagggtatac gaacagcaag tcgagcagg tgggaatttt 480
caactacgaa ttcatgatca gatcataatg cttgattctg caaaagcaac gacagagaca 540
gttgcgtcat tgagatctgg tgctagtgtc atgaaggcta tgccaaaagc aacaaacatt 600
gatgatgtgg acaagacaat ggatgagatc aatgagcaga ccgataactt gagacagata 660
caggaggcac tagctactcc ttgggtgc当地 actgattttg atgaggatga attggaaagct 720
gagcttgaag aacttgaagg agctgatgtt gaggaacaac ttctacaacc atttacaact 780
gcccctacgg caccattca tggccagaa ggcaagctgc cagcaaggcc aacaccccaa 840
aagaactctg aggaagatga actcgctgc当地 ttacaaggc当地 aaatggcact ttgaaggctt 900
ttctttttc atgtttataa tcatgtccca aagaaatgga aacgggctgg aaaaagaaaa 960
aggcaagga aaagaaaaagg aaaagaaaaa gattgaaaat ctttattgtat tgatgggt 1020
atatttaagt attgagtgtt gatagcatct tgggtcatg tactatatgc ctatatggag 1080
tacgtttaatggtaa tggtaatgca aatattgtct ataccattga tgaacaaaga 1140
tggggctgt aaactcttgg ttgtttttc gttttcaat ttttgggtt cgttttatt 1200
ttcagtcac ctactggttc tagtgactgg tgacaattgc tgtacagaga tttgttgca 1260
cttgagctgc tggtaacacag actatgcaga ctgtcagatt tataaaatca gaaagctggc 1320
aaaaaaaaaaa aaaaaaaaaact cgag 1344

<210> 2
<211> 224
<212> PRT
<213> Beta vulgaris

<400> 2

9-17-08-4982-12-sequence listing.txt

Met Ser Ala Asn Met Phe Ser Arg Leu Phe Gly Ala Lys Ser Arg Asp
 1 5 10 15
 Ala Ala Thr Thr Glu Thr Thr Leu Ser Thr Leu Glu Lys Leu Asn Glu
 20 25 30
 Thr Leu Glu Met Leu Glu Lys Lys Glu Gln Leu Leu Met Lys Lys Ala
 35 40 45
 Thr Ala Glu Val Glu Lys Ala Lys Glu Phe Thr Arg Ala Lys Asn Lys
 50 55 60
 Arg Ala Ala Ile Gln Cys Leu Lys Arg Lys Arg Leu Tyr Glu Gln Gln
 65 70 75 80
 Val Glu Gln Val Gly Asn Phe Gln Leu Arg Ile His Asp Gln Ile Ile
 85 90 95
 Met Leu Asp Ser Ala Lys Ala Thr Thr Glu Thr Val Ala Ala Leu Arg
 100 105 110
 Ser Gly Ala Ser Ala Met Lys Ala Met Gln Lys Ala Thr Asn Ile Asp
 115 120 125
 Asp Val Asp Lys Thr Met Asp Glu Ile Asn Glu Gln Thr Asp Asn Leu
 130 135 140
 Arg Gln Ile Gln Glu Ala Leu Ala Thr Pro Val Gly Ala Thr Asp Phe
 145 150 155 160
 Asp Glu Asp Glu Leu Glu Ala Glu Leu Glu Glu Leu Glu Gly Ala Glu
 165 170 175
 Leu Glu Glu Gln Leu Leu Gln Pro Phe Thr Thr Ala Pro Thr Ala Pro
 180 185 190
 Ile His Val Pro Glu Gly Lys Leu Pro Ala Arg Pro Thr Pro Gln Lys
 195 200 205
 Asn Ser Glu Glu Asp Glu Leu Ala Ala Leu Gln Ala Glu Met Ala Leu
 210 215 220

<210> 3
 <211> 1341
 <212> DNA
 <213> Beta vulgaris

<220>
 <221> misc_feature
 <222> (934)..(934)
 <223> n is a, c, g, or t

<400> 3
 cccgcctgca ggaattcggc acgagagaaa acctgtctta tacttctcta ctttgctttt 60
 ttgtttttgt tagccaaacca atctaaccctt gaattgtataa tcccaactt caattccctc 120
 aaaattttc ttccaaaattt catttccactt attttcagat atttcatcac taaaatctcc 180
 tcgagttAAC ctaatcactt catttccattt ccctctcgaa aaaaaaccta atcaatcaac 240
 tttacgcggT ttcattctcc gatcttttc gtttcctcgt aattttttag cgatcaccca 300
 ttttcgttaa atatgtttac aagggttttc ggttaaaccta aggaaggaac aacgagtgt 360
 gttgcaacgt tagacaaattt gagtgagaca ctcgaaatgt tgaaaaaaa agaacagggt 420
 ctttgcggaaaggctgggtc tgaggttgaa aaggccaagg agttcaactag agcaaagaac 480
 aaacgtgctg ctataacttg tctgaagagg aagaggctat acgaacaaca aatagagcag 540
 cttggaaaca tgcagttgcg aattcatgtat cagatgatac tgcttgaagg ggcaaaggca 600

9-17-08-4982-12-sequence listing.txt

acaacagaga	ctgtcgatgc	attgaggct	ggtcctcgg	ctatgaaggc	catgcaaaag	660
gcaacaaca	tcgataatgt	ggataaaact	atggacgaga	tcaatgagca	gacagagaac	720
ttaaaacaaa	tacaggaagc	tctctgtct	ccaatcggtg	cagcagctga	ctttgtatga	780
ggatgacctg	aaagcagagc	ttgaagagct	agaagggtct	gaattgaaga	agcaacttat	840
cagcccgact	actactgctc	ctgctgcacc	agtgcatgt	cctgctggaa	aacaacctga	900
cgcggctgca	cctcgggaaag	aatactgctt	gaanaggatg	agctcgccgc	gttgcagca	960
gagatggccc	ctgtaaaaag	ttttctgga	cttggataca	ggagttggtc	ttacatcaaa	1020
gtagctgtat	aataagctaa	ttattattgc	tttgggtacc	acctttacag	gcacgtat	1080
cccaatcacg	gatatttgg	aataaaatgt	gctgtgtagg	ttgcgtatgt	ttgttgat	1140
ggccgtatgtt	ctccttgc	caggtcttga	ttgcaccta	ttctcgatgt	aaatttcaga	1200
ttctcttata	gacattgtaa	tttggacaa	aatatcgatc	atttggtacg	agttaacccct	1260
tcacatatgt	aaaagaaaata	aaatacaatt	cttgtatgac	tttattttaa	ccaaaaaaaaa	1320
aaaaaaaaaa	aactcgaggg	g				1341

<210> 4
<211> 154
<212> PRT

<213> Beta vulgaris

<400> 4

Met	Phe	Thr	Arg	Val	Phe	Gly	Lys	Pro	Lys	Glu	Gly	Thr	Thr	Ser	Ala
1				5				10					15		

Val	Ala	Thr	Leu	Asp	Lys	Leu	Ser	Glu	Thr	Leu	Glu	Met	Leu	Glu	Lys
				20			25				30				

Lys	Glu	Gln	Val	Leu	Leu	Lys	Lys	Ala	Gly	Ala	Glu	Val	Glu	Lys	Ala
		35				40				45					

Lys	Glu	Phe	Thr	Arg	Ala	Lys	Asn	Lys	Arg	Ala	Ala	Ile	Thr	Cys	Leu
		50			55				60						

Lys	Arg	Lys	Arg	Leu	Tyr	Glu	Gln	Gln	Ile	Glu	Gln	Leu	Gly	Asn	Met
65				70				75					80		

Gln	Leu	Arg	Ile	His	Asp	Gln	Met	Ile	Leu	Leu	Glu	Gly	Ala	Lys	Ala
			85			90						95			

Thr	Thr	Glu	Thr	Val	Asp	Ala	Leu	Arg	Ser	Gly	Ala	Ser	Ala	Met	Lys
		100			105							110			

Ala	Met	Gln	Lys	Ala	Thr	Asn	Ile	Asp	Asn	Val	Asp	Lys	Thr	Met	Asp
		115				120					125				

Glu	Ile	Asn	Glu	Gln	Thr	Glu	Asn	Leu	Lys	Gln	Ile	Gln	Glu	Ala	Leu
	130				135					140					

Ser	Ala	Pro	Ile	Gly	Ala	Ala	Ala	Asp	Phe						
145				150											

<210> 5
<211> 1019
<212> DNA
<213> Beta vulgaris

<220>
<221> misc_feature
<222> (5)..(5)
<223> n is a, c, g, or t

<220>
<221> misc_feature

9-17-08-4982-12-sequence listing.txt

<222> (1001)..(1001)
<223> n is a, c, g, or t

<210> 6
<211> 204
<212> PRT
<213> Bet

<400> 6
 Met Gly Asn Thr Glu Lys Leu Met Asn Gln Ile Met Glu Leu Lys Phe
 1 5 10 15
 Thr Ser Lys Ser Leu Gln Arg Gln Ser Arg Lys Cys Glu Lys Glu Glu
 20 25 30
 Lys Ala Glu Lys Leu Lys Val Lys Lys Ala Ile Glu Lys Gly Asn Met
 35 40 45
 Asp Gly Ala Arg Ile Tyr Ala Glu Asn Ala Ile Arg Lys Arg Thr Glu
 50 55 60
 Gln Met Asn Tyr Leu Arg Leu Ala Ser Arg Leu Asp Ala Val Val Ser
 65 70 75 80
 Arg Leu Asp Thr Gln Ala Lys Met Gln Thr Ile Gly Lys Ser Met Gly
 85 90 95
 Ser Ile Val Lys Ser Leu Glu Ser Ser Leu Asn Thr Gly Asn Leu Gln
 100 105 110
 Lys Met Ser Glu Thr Met Asp Asn Phe Glu Lys Gln Phe Val Asn Met
 115 120 125
 Glu Val Gln Ala Glu Phe Met Glu Ser Ser Met Ala Gly Ser Thr Ser
 130 135 140
 Leu Ser Thr Pro Glu Thr Glu Val Asn Ser Leu Met Gln Gln Val Ala
 145 150 155 160
 Asp Asp Tyr Gly Leu Glu Val Ser Val Gly Leu Pro Gln Ala Ala Gly
 165 170 175
 His Ala Ile Pro Val Pro Lys Ala Ala Glu Lys Val Asp Glu Asp Asp
 180 185 190

9-17-08-4982-12-sequence listing.txt

Leu Thr Arg Arg Leu Ala Glu Leu Lys Ala Arg Gly
 195 200

<210> 7

<211> 1510

<212> DNA

<213> Beta vulgaris

<220>

<221> misc_feature

<222> (2)..(3)

<223> n is a, c, g, or t

<400> 7

tnnccgggc	tgcaggaatt	cggcacgagc	tcatttctct	acatcaaaaa	cacaacaaag	60
agatcaccca	ttggcggaga	aaccataag	ccagaatcaa	cggtggctga	agtgggtggtt	120
ccagtagccg	agaaaccaggc	tgagaagcca	gctgagaagg	cagttctacc	acctgaagct	180
gagaaactag	ctgcagctga	atcaagctgaa	gccgagaaggc	cagctgattc	agccgaggct	240
aagatagtc	acaaggcttc	atccaagag	gagactaatg	ttgcaagtga	gctacccctgag	300
ctacatagaa	aggctctcga	ggacttgaag	aaacttattc	aagaaggccct	cgagaagcac	360
gagttctctt	tcctccctcc	tccgcctccg	cctgctccag	ctaaagttga	ggagaaggcg	420
gaagagaaga	aagaggaaca	acccatcc	accacccatcc	ccaccaccac	caccaccacc	480
gcggtttcag	atgaggttgc	ttttgtctct	ccatccgaag	aggccccgaa	aactgacgag	540
gcctctccga	aagtggagga	ggagcctgca	aaaatagttg	agcaaccacc	tacaacaccg	600
gcagaagaac	ctgaaccaggc	aaaacacac	gagggttgg	ttgctgaaga	ggagaaaact	660
ggtgaggata	ttaaagaaac	tatagtagtc	gagggtcgca	caactacagc	agcaccagta	720
ctaacagaac	cagaatctgt	tgaggagaca	ccaaaagaag	ctgaagttgt	agtggaaagaa	780
tcaccaaagg	agccagaaga	agtatcaata	tggggaaattc	cacttctgc	tgatgaaaga	840
agtgtatgtaa	ttcttattgaa	attcttaaga	gcaagagatt	atagagtgaa	agatgcttc	900
actatgatta	gaaataactgc	tcgttgaga	aaagaatttgc	aggttggattc	tttacttgat	960
gaagatcttg	gaaatgatta	tgagaaagtt	gtttttacac	atggagttga	taaacaaggt	1020
cgtcctgttt	gttataatgt	gtttggagag	tttcaaaata	aggaacttta	tcagaataact	1080
ttctctgtatg	cagaaaaaaag	gaaaaagttc	ttgagatgtt	tgattcaatt	ccttgaaaaa	1140
actattagaa	ctcttgattt	tagtccgtaa	ggaatttaatt	cttttggttct	tgttaatgtat	1200
ttgaagaattt	ctcctgggtt	tggttaagaga	gatctttaca	aagttattga	caagtttctt	1260
gagattctcc	aggataatta	cccagaattt	gctgctaaac	agttgtgcatt	caatgtttca	1320
tggtggtctt	ggcataacaac	tggatctatt	tgactgtatt	tacaccaagg	agcaagagca	1380
agtttgtt	tgcaagccca	tctaaaactg	ctgagacccct	tttcaagtac	atagctccctg	1440
agcagggtgcc	tgttcaattt	ggtgggcaca	gcaagtttgg	cgagcatgag	ttttcccttg	1500
ctgatactgt						1510

<210> 8

<211> 427

<212> PRT

<213> Beta vulgaris

<400> 8

Met	Ala	Glu	Glu	Thr	His	Lys	Pro	Glu	Ser	Thr	Val	Ala	Glu	Val	Val
1															15

Val	Pro	Val	Ala	Glu	Lys	Pro	Ala	Glu	Lys	Pro	Ala	Glu	Lys	Ala	Val
															30

Leu	Pro	Pro	Glu	Ala	Glu	Lys	Leu	Ala	Ala	Ala	Glu	Ser	Ala	Glu	Ala
															45

Glu	Lys	Pro	Ala	Asp	Ser	Ala	Glu	Ala	Lys	Ile	Ala	Gln	Gln	Val	Ser
															60

Phe	Lys	Glu	Glu	Thr	Asn	Val	Ala	Ser	Glu	Leu	Pro	Glu	Leu	His	Arg
65															80

9-17-08-4982-12-sequence listing.txt

Lys Ala Leu Glu Asp Leu Lys Leu Ile Gln Glu Ala Leu Glu Lys
85 90 95

His Glu Phe Ser Ser Pro Pro Pro Pro Pro Pro Ala Pro Ala Lys
100 105 110

Val Glu Glu Lys Ala Glu Glu Lys Lys Glu Glu Gln Pro Pro Ser Thr
115 120 125

Thr Ser Thr Thr Thr Thr Thr Ala Val Ser Asp Glu Val Ala
130 135 140

Val Ala Pro Pro Ser Glu Glu Ala Pro Lys Thr Asp Glu Ala Ser Pro
145 150 155 160

Lys Val Glu Glu Glu Pro Ala Lys Ile Val Glu Gln Pro Pro Thr Thr
165 170 175

Pro Ala Glu Glu Pro Glu Pro Ala Lys Thr Pro Glu Val Val Val Ala
180 185 190

Glu Glu Glu Lys Thr Gly Glu Asp Ile Lys Glu Thr Ile Val Val Glu
195 200 205

Val Ala Thr Thr Thr Ala Ala Pro Val Leu Thr Glu Pro Glu Ser Val
210 215 220

Glu Glu Thr Pro Lys Glu Ala Glu Val Val Val Glu Glu Ser Pro Lys
225 230 235 240

Glu Pro Glu Glu Val Ser Ile Trp Gly Ile Pro Leu Leu Ala Asp Glu
245 250 255

Arg Ser Asp Val Ile Leu Leu Lys Phe Leu Arg Ala Arg Asp Tyr Arg
260 265 270

Val Lys Asp Ala Phe Thr Met Ile Arg Asn Thr Ala Arg Trp Arg Lys
275 280 285

Glu Phe Glu Val Asp Ser Leu Leu Asp Glu Asp Leu Gly Asn Asp Tyr
290 295 300

Glu Lys Val Val Phe Thr His Gly Val Asp Lys Gln Gly Arg Pro Val
305 310 315 320

Cys Tyr Asn Val Phe Gly Glu Phe Gln Asn Lys Glu Leu Tyr Gln Asn
325 330 335

Thr Phe Ser Asp Ala Glu Lys Arg Lys Lys Phe Leu Arg Trp Leu Ile
340 345 350

Gln Phe Leu Glu Lys Thr Ile Arg Thr Leu Asp Phe Ser Pro Glu Gly
355 360 365

Ile Asn Ser Phe Val Leu Val Asn Asp Leu Lys Asn Ser Pro Gly Tyr
370 375 380

Gly Lys Arg Asp Leu Tyr Lys Val Ile Asp Lys Phe Leu Glu Ile Leu
385 390 395 400

Gln Asp Asn Tyr Pro Glu Phe Ala Ala Lys Gln Leu Cys Ile Asn Val
405 410 415

9-17-08-4982-12-sequence listing.txt

Ser Trp Trp Ser Trp His Thr Thr Gly Ser Ile
420 425

<210> 9
<211> 2052
<212> DNA
<213> Beta vulgaris

```
<220>
<221> misc_feature
<222> (2049)..(2049)
<223> n is a, c, g, or t
```

<210> 10
<211> 504
<212> PRT
<213> Beta vulgaris

<400> 10
Met Asp Glu Tyr Ser Asn Arg Lys Ser Ser Gly Leu Ala Ile Ser Arg
1 5 10 15

Arg Gly Pro Ser Leu Val Leu Arg Asp Ser Ala Glu Asn Asn Lys Asp
20 25 30

9-17-08-4982-12-sequence listing.txt

Arg Asn Val Gln Val Cys Ser Arg Val Gly Cys Gly Ser Lys Leu Asn
 35 40 45

Ser Val Lys Asp Ala Lys Val Ser Ser Pro Ser Lys Val Lys Ser Pro
 50 55 60

Lys Thr Pro Phe Arg Ser Ser Ala Gln Gly Lys Glu Thr Ile Gly Ser
 65 70 75 80

Ser Ser Arg Thr Leu Ala Ser Pro Ser Pro Phe Lys Lys Ser Leu Ser
 85 90 95

Asp Arg Lys Lys Lys Leu Pro Ser Asn Leu Asp Thr Asp Ser Glu Met
 100 105 110

Cys Ser Leu Gln Asp Glu Ser Glu Glu Val Ser Gly Lys Thr Arg Ile
 115 120 125

Arg Val Gln Pro Glu Pro Glu Asp His Asp Ser Ile Glu Ala Ser Ser
 130 135 140

Ser Glu Ala Gly Ser Ser Ser Gly Pro Ser Asn Arg Leu Ala Asn
 145 150 155 160

Arg Asn Thr Gln Arg Phe Gly Leu Gly Arg Gln Asp Ser Ala Ala Ser
 165 170 175

Ser Ala Ser Phe Ser Leu Asn Lys Thr Asn Gln Gly Gln Arg Asn Gly
 180 185 190

Gly Gly Gly Ala Ser Ala Asn Arg Tyr Asn Leu Arg Gln Leu Lys
 195 200 205

Cys Asn Ser Ile Ser Asp Val Val Pro Ser Gly Ser Pro Gln Ser Ala
 210 215 220

Glu Ser Ser Leu Ser Lys Lys Arg Asp Thr Gly Cys Arg Lys Arg Asn
 225 230 235 240

Gly Glu Ala Glu Ser Ser Leu Pro Val Arg Gly Lys Lys Ile Asn Gly
 245 250 255

Ala Thr Gln Asp Asp Arg Arg Asn Asp Tyr Pro Asn Arg Gly Ile Ser
 260 265 270

Ile Ser Asp Thr Arg Arg Thr Arg Ser Ser Ser Pro Gly Asn Asn Asp
 275 280 285

Val Thr Ser Val Arg Ser Arg Arg Ser Val Ala Arg Thr Arg Leu Ser
 290 295 300

Asn Gln Asp Thr Arg Asp Arg Leu Pro Leu Val Glu Ser Pro Leu Arg
 305 310 315 320

Asn Pro Ser Ser Pro Leu Pro Glu Ser Ser Thr Gly Gly Thr Asp Phe
 325 330 335

Ser Leu Glu Asn Gln Phe Ser Gly Arg Thr Pro Ala Gly Ser Leu Ser
 340 345 350

Ser Tyr Asn Arg Pro Gly Gly Ser Glu His Met Arg Pro Ser Arg
 355 360 365

9-17-08-4982-12-sequence listing.txt

Ser Ile Asp Pro Tyr Glu Ala Gly Ile Ala Arg Ser Phe Met Asn Arg
370 375 380
Asp Thr Leu Arg Gln Tyr Asn Leu Asp Gly Ile Ala Glu Met Leu Leu
385 390 395 400
Ala Leu Glu Arg Ile Glu Gln Glu Glu Asp Pro Thr Tyr Glu Gln Leu
405 410 415
Leu Val Leu Glu Thr Asn Leu Phe Leu Gly Gly Leu Ser Phe His Asp
420 425 430
Gln His Arg Asp Met Arg Leu Asp Ile Asp Asn Met Ser Tyr Glu Glu
435 440 445
Leu Leu Ala Leu Glu Glu Ser Met Gly Thr Val Arg Gln Pro Cys Gln
450 455 460
Lys Met Ile Trp Leu Ser Val Leu Lys Gly Thr Ser Thr Arg Val Leu
465 470 475 480
Gln Ile Val Glu Arg Met Ser Met Ile Ser Asn Ala Ala Tyr Ala Arg
485 490 495
Lys Asn Met Val Ala Gly Lys Lys
500

<210> 11
<211> 27
<212> PRT
<213> Beta vulgaris

<400> 11

His Asp Gln His Arg Asp Met Arg Leu Asp Ile Asp Asn Met Ser Tyr Glu
1 5 10 15
Glu Leu Leu Ala Leu Glu Glu Arg Ile Gly
20 25